

A PEDICEL GALL ON TRICHOSTEMA

BY JAMES G. NEEDHAM

There is a little mint flower that grows on Longboat Key opposite Sarasota, Florida. It is a bushy species of *Trichostema* of boot-top height. It branches from the base and forms a rounded heap of rather dense evergreen foliage, above which it rears a few tall leafless open panicles of inflorescence. In the slender terminal pedicels of these panicles I found specimens of the little woody gall that is the subject of this paper. The moth that causes the gall is a slender black and white lavernid kindly determined for me by Dr. W. T. M. Forbes as *Mompha sexnotella* Chambers.

The plant is *Trichostema suffrutescens*. It grows in the outer edges of rounded tussocks of grass, sharing this situation with the much commoner horse-mint, *Monarda dispersa*. Between the tussocks are areas of bare soil; a hard and sterile soil, composed of marine shells washed up by the waves from the Gulf of Mexico, and in all stages of disintegration. The narrow strips of this peculiar meadow lie behind an aggrading storm-wave reef. Here and there in them are patches of white wind-blown sand, partly covered by the soft green mats of a lupine, *Lupinus diffusus*. Wherever the soil has been disturbed (as around the burrows of gopher turtles) the low sunflower, *Helianthus debilis*, spreads its halberd-shaped leaves and procumbent branches. It blooms there gloriously in January.

I found the galls there on January 5 at the end of the flowering season. The massed foliage was fresh and green and scented with a delicate fragrance, less pungent than that of the horse-mint. The fruiting panicles at the top were bare and brown, each terminal twig bearing the persistent strongly bilabiate calyx. In some of the calyces there still nestled four, whitish, pock-marked seeds.

Here and there was a terminal twig that had been made over into an ocarina-shaped gall of about the size of a peanut. A few of the galls were still green with a wash of reddish color on the side exposed to the sun; their thicker tissues had dried up more

slowly than the rest of the panicle. Most of them were brown, some of the older ones were black. Their size made them easy to find among the slender twigs.

The gall is short-spindle-shaped, 15 to 20 millimeters long, 5 to 8 wide, smoothly contoured and slightly inequilateral. Its walls are woody, thick and very hard. The entire gall involves two internodes of the twig, and the node between the two lies near the distal end of it at a place that is marked by the vestiges of what would normally be a pair of opposite branchlets. There is a little low protuberance on one side near the base—a predetermined point at which the exit door will be made for the emergence of the adult insect.

The cavity of the gall lies mainly in the lower internode. It is oval and wide, loose-fitting for the caterpillar, and it tapers upward to a narrowing tube in the distal internode which serves the occupant for a frass receptacle.

Inside the woody layer of the wall there is another hard and very brittle layer whose components I was unable to determine. It occupies the position of the layer of nutritive tissue that feeds the larva during its development; but in the old galls, containing only full-fed larvæ, this layer is nearly as hard and as thick as the wood, and much more brittle. At first I found it difficult to get a larva out uninjured; for the gall cannot be split and pried open without crushing this inner hard layer. I found it possible by sticking a knife point through the softer distal end of the gall, where the frass receptacle is, and breaking off that portion, then putting the knife point inside the hole thus laid open and pushing outward, so chipping the remaining wall away in pieces, the larva could be uncovered and withdrawn uninjured. In this process the cylindrical, brittle layer would sometimes remain intact, entirely freed from the wood. Perhaps some frass enters into the composition of the brittle layer; for the frass in the over-filled receptacle seems to be continued down the widening sides of the gall under a thin transparent layer of silk.

In cutting open a score or more of galls I found some of them empty, the exit hole open, and the empty abandoned pupal skin of the moth left lying inside. Most of the galls contained fat larvæ, nestled down where the gall narrows to the exit door with

only a thin pellicle of epidermis closing the door. One gall had a young and active larva still engaged in clearing the exit passage way, the silk lining of the gall completed only in its upper half.

Notwithstanding hard walls for its protection, the gallmaker has enemies that find it. Two of the galls first examined contained adult braconid parasites; adults apparently about ready for emergence. They had eaten the moth larva and then they had spun their own slender cocoons obliquely across the gall cavity. The empty skins of the caterpillars lay beside the cocoons of the parasites. The braconids had bored their own holes for exit; round holes about half as large as the moths would require, situated near the middle of the gall. They made no use of the moth's easier way out at the lower end of the gall. Twelve more of these braconids emerged later from galls that I had placed in the rearing cages. The adults were sent to Dr. C. F. W. Muesebeck for determination. He reports that they represent an undescribed species of the braconid genus *Heterospilus*. The specimens are now in the United States National Museum.

The moth larvæ also have larger enemies. I found about a dozen of the galls had been gnawed open apparently by the teeth of rodents; possibly by cotton rats. Mr. William Hegener was catching these animals in traps in this same strip of shoreland meadow.

The emergence of the adult moths was slow and irregular. From galls collected on January 5, the first moth came out on the last day of the month; and others came out at long intervals for two months thereafter.

The living adult is a delight to the eye: a slender resplendent mothlet, ringed and spotted with black and white in perfect camouflage; its long wings shedding bronze and coppery reflections, and on the middorsal line, where fore wings meet and cover the feathery edgings of the hind wings, tufts of elevated scales rise in three little rounded heaps that shine like globules of quicksilver.